



### **REMARKS**

Upon entry of this Amendment, claims 15-36 remain pending and under current examination. In the Office Action,<sup>1</sup> the Examiner took the following actions;

- (a) objected to claims 16 and 21 for insufficient antecedent basis;
- (b) rejected claims 15-20 under 35 U.S.C. § 102(e) as being anticipated by Johnson et al. (U.S. Patent No. 6,198,860) ("Johnson");
- (c) rejected claim 26 under 35 U.S.C. § 103(a) as being unpatentable over Johnson;
- (d) rejected claim 27 under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of Takiguchi et al. (U.S. Patent App. Pub. No. US2005/0271318A1) ("Takiguchi"); and
- (e) objected to claims 21-25 and 28 as being dependent upon a rejected base claim, but indicated they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants traverse the objections and rejections for the following reasons.

#### **Regarding the Claim Amendments:**

Applicants have amended claims 15 and 21 to provide proper antecedent basis only, and have added new claims 29-36 to protect additional aspects related to the present invention.

Support for the amendments can be found in the specification at, for example, p. 19, line 15 to p. 20, line 27, p. 21, lines 10-11, and Figs. 7a and 7b.

#### **Objection to Claims 16 and 21:**

The Examiner objected to claims 16 and 21 for insufficient antecedent basis. In response to the objection, Applicants have amended claim 15 to recite "...at least a first input optical waveguide directed along a first axis ( $x_1$ ) and a second input optical waveguide directed along a

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<sup>1</sup> The Office Action may contain statements characterizing the related art, case law, and claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

second axis ( $x_2$ ) included with respect to the first axis...”; and have amended claim 21 to recite

“...wherein said first and second ~~directions~~ axes define an angle of  $\pi/3$ ” (amendments shown).

Applicants therefore deem the objection overcome, and accordingly request its withdrawal.

**Rejection of Claims 15-20 under 35 U.S.C. § 102(e):**

Applicants request withdrawal of the rejection of claims 15-20 under 35 U.S.C. § 102(e) as being anticipated by Johnson. Applicants traverse the rejection for at least the following reasons.

In order to properly establish anticipation under 35 U.S.C. § 102, the Federal Circuit has held that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). *See also* M.P.E.P. § 2131.

Johnson does not disclose each and every element of Applicants’ claimed invention. Specifically, Johnson does not disclose at least Applicants’ claimed “photonic crystal having a regular periodicity in said optical crossing region” (independent claim 15). Applicants point out that the specification specifically defines that “with ‘photonic crystals having regular periodicity’ it is intended a photonic crystal wherein the characteristics of its periodic array do not vary at least in a region thereof of intended light propagation.” Specification, p. 3, lines 26-30.

In contrast, viewing Johnson’s Fig. 6B and corresponding disclosure, Applicants point out that:

[a]s the basis for the [photonic crystal] structure, a two-dimensional square lattice of dielectric rods 602 is used, which is a photonic crystal 600 with a band gap for TM-polarized light, as shown in FIG. 6B. [...] In the intersection, a dielectric rod 604

with a radius 50% larger than that of the normal rods, is positioned surrounded by various numbers of layers of unperturbed photonic crystal to form the resonant cavity. This rod radius is known to induce a doubly-degenerate resonant cavity state having the required symmetry. Johnson, col. 5, lines 39-51.

As shown in Johnson's Fig. 6B, defect rod 604 is positioned at the center of the "perfect crystal," thereby varying the characteristics of its periodic array in a region of intended light propagation. This is in direct contrast to Applicants' claimed "photonic crystal," as the term is defined in the specification on p. 3, lines 26-30.

Applicants point out that they may define claim terms in the specification, such as the claimed "photonic crystal," as they so choose. The M.P.E.P. states that "[w]here an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) (meaning of words used in a claim is not construed in a "lexicographic vacuum, but in the context of the specification and drawings")." M.P.E.P. § 2111.01(III), 8th Ed., Rev. 4 (October 2005), p. 2100-50.

[While] any special meaning assigned to a term "must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention" [internal citations omitted] [t]he specification should also be relied on for more than just explicit lexicography or clear disavowal of claim scope to determine the meaning of a claim term when applicant acts as his or her own lexicographer; the meaning of a particular claim term may be defined by implication, that is, according to the usage of the term in context in the specification. Id.

Therefore, Applicants note the definition of the claimed "photonic crystal" as it appears on page 3 of the specification, which highlights clear differences between Johnson and the claimed "photonic crystal having a regular periodicity in said optical crossing region" (claim 15).

Thus, even though Johnson discloses a crystal in Fig. 6B (and its corresponding description), Johnson does not disclose the claimed “photonic crystal” as defined in Applicants’ specification.

Independent claim 15 is therefore allowable, and dependent claims 16-20 are allowable at least by virtue of their dependence from base claim 15. Therefore, the 35 U.S.C. § 102(e) rejection of claims 15-20 is improper and should be withdrawn.

**Rejection of Claim 26 under 35 U.S.C. § 103(a):**

Applicants request reconsideration and withdrawal of the rejection of claim 26 under 35 U.S.C. § 103(a) as being unpatentable over Johnson. Applicants respectfully disagree with the Examiner’s arguments and conclusions. A *prima facie* case of obviousness has not been established. As M.P.E.P. § 2142 states, “[t]he examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.”

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). M.P.E.P. § 2142, 8th Ed., Rev. 4 (October 2005), p. 2100-134.

Each of these requirements must “be found in the prior art, and not be based on applicant’s disclosure.” M.P.E.P. § 2143. A requirement for establishing a *prima facie* case of obviousness is not met, because Johnson does not teach or suggest every feature of Applicants’ claims.

The Examiner alleged that “although not explicitly stated, Johnson et al does show the first and second input waveguides to be integrated waveguides.” Office Action, p. 5. In response, and on the basis of the reasoning presented in the previous section regarding the

inadequacies of the 35 U.S.C. § 102(e) rejection over Johnson, Applicants submit that Johnson still does not teach or suggest each and every element of independent claim 15, as required by dependent claim 26. That is, Johnson still does not teach or suggest at least the claimed “photonic crystal” as defined in Applicants’ specification.

Dependent claim 26 is therefore allowable for the reasoning presented, and at least by virtue of its dependence from base claim 15. Therefore, the 35 U.S.C. § 103(a) rejection of claim 26 is improper and should be withdrawn.

**Rejection of Claim 27 under 35 U.S.C. § 103(a):**

Applicants request reconsideration and withdrawal of the rejection of claim 27 under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of Takiguchi. Applicants respectfully disagree with the Examiner’s arguments and conclusions. A *prima facie* case of obviousness has not been established.

Further to the deficiencies of Johnson discussed above regarding independent claim 15, the Examiner admitted that Johnson “fails to specifically disclose the first and second input optical waveguides to be optical fibers.” Office Action, p. 5. The Examiner then applied Takiguchi to show “a core and cladding optical fiber configuration capable of transmitting and receiving a signal from a photonic crystal device.” Id.

In response, and supplemental to the reasoning already presented regarding Johnson, Applicants submit that Takiguchi does not qualify as prior art against the present application. As M.P.E.P. § 2136.03(II) sets forth, regarding critical reference dates for international (PCT) applications,

[i]f the international application was filed on or after November 29, 2000, [and] was **not** published in English under PCT Article 21(2), do **not** treat the international filing date as a U.S. filing date. In this situation, do **not** apply the reference as of its international

filing date, its date of completion of the 35 U.S.C. 371(c)(1), (2) and (4) requirements, or any earlier filing date to which such an international application claims benefit or priority. The reference may be applied under 35 U.S.C. 102(a) or (b) as of its publication date, or 35 U.S.C. 102(e) as of any later U.S. filing date of an application that properly claimed the benefit of the international application (if applicable). M.P.E.P. § 2136.03(II), p. 2100-103 (emphasis in original).

Takiguchi was filed as a PCT application on September 26, 2001. Online research on the WIPO database indicates that the PCT application from which Takiguchi claims priority was filed in the Japanese language, and published in the Japanese language on April 4, 2002. Therefore, the relevant prior art date for the Takiguchi reference is its U.S. publication date of December 8, 2005. Thus, Applicants' earlier U.S. filing date of April 19, 2005 disqualifies Takiguchi as prior art against the present application.

Even if Takiguchi could be considered prior art by the PCT publication date of April 4, 2002, which it cannot, Applicants also note that the current application is a § 371 National Stage Application of PCT/EP02/02484, filed on March 6, 2002. The priority claim to PCT/EP02/02484, filed March 6, 2002, also antedates Takiguchi's PCT publication date of April 4, 2002.

Accordingly, under M.P.E.P. § 2136.03(II), Takiguchi does not qualify as prior art to the present application, rendering moot the rejection of claim 27 under 35 U.S.C. § 103(a) over the combination of Johnson and Takiguchi. Dependent claim 27 is therefore allowable for the reasoning presented, and at least by virtue of its dependence from base claim 15. Therefore, the 35 U.S.C. § 103(a) rejection of claim 27 should be withdrawn.

**Objection to Claims 21-25 and 28:**

The Examiner objected to claims 21-25 and 28 as being dependent upon a rejected base claim, but indicated they would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. Applicants have demonstrated herein that claims 15-20, 26, and 27 are allowable. Therefore, claims 21-25 and 28 are also allowable at least due to their dependency, either directly or indirectly, from base claim 15. Accordingly, Applicants request withdrawal of the objection to claims 21-25 and 28.

**Conclusion:**

In view of the foregoing, Applicants request reconsideration of the application and withdrawal of the objections and rejections. Because Applicants' amendments and arguments have removed all of the pending objections and rejections, pending claims 15-36 are in condition for allowance. Applicants request a favorable action.

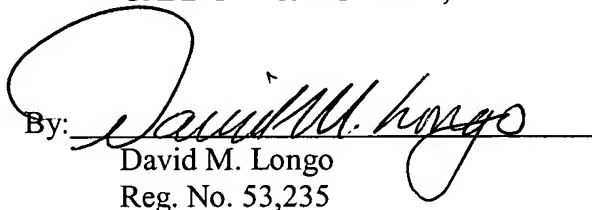
If there are any remaining issues or misunderstandings, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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